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ON TRINOMIAL NOMENCLATURE.

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By some remarks on trinomial nomenclature in the very able and discriminating review of 'The Coues Check List of North American Birds,' published in the October number of 'The Zoologist' (1882, p. 396), I am forcibly reminded how little our English fellow-workers understand what the trinomial nomenclature of American zoologists really is, and how little they appreciate its purpose and import. To most English authorities who have referred to it, it seems to have proved the most thorough stumbling-block imaginable; indeed, to us on this side the water it is a mystery that it should be so universally misunderstood.

To explain clearly the points at issue it is necessary to refer briefly to the recent history of our knowledge of North American birds. Those who have closely followed our ornithological literature for the past twelve years must appreciate how thoroughly the Ornithology of North America has been studied, both in the field and in the museum, or how vast is the amount of material which has passed under the critical eye of experts. The whole of our immense trans-Mississippian territory, as well as Florida, Alaska, and portions of Mexico and the British Possessions, has been traversed and more or less carefully explored by well-trained collectors, their accumulated spoils amounting to not less than 50,000 to 75,000 specimens. Except

in case of the rarer forms, the generalisations reached have been based on hundreds of examples of each species and subspecies, gathered from every portion of the habitat of the form in question. The elaboration of this material has resulted in the discovery of intergradation between forms whose specific distinctness was not previously even questioned, and which would now pass as well entitled to specific recognition were the connecting links unknown. Furthermore, it has been found that various portions of the continent present phases of differentiation, more or less strongly marked, peculiar to each, and which affect the greater portion of the species by which they are inhabited; while the intermediate and connecting regions furnish a gradual transition between the forms typical of the remoter districts—a transition as gradual as, and correlated with, the changes in the geographical and climatic conditions of the connecting area. In other words, these investigations have led to the recognition of certain general laws of geographical variation which are accepted by all of our ornithologists of recognised authority.

In consequence of the accumulation and study of this immense amount of material it has been found that three, four, or even half a dozen species formerly in good standing, because known from only a few examples, really form one specific group, with more or less strongly differentiated types in different portions of the general habitat, which, however, are inseparably connected by series of examples from intermediate districts. While all these intergrading forms are, in consequence of their known intergradation, referred to a single species, each differs so much from the other, as they approach their extreme phases of divergence, that the differences seem too great to pass unnoticed, and are therefore recognised nominally, and at the same time in such a manner as to indicate their true status and relationship. The forms trinominally designated are simply well-marked local forms, geographical races, incipient species, subspecies, or "varieties," in the sense in which the latter term is commonly employed.

To refer now to the text which has given rise to this bit of preaching, the writer says: "For instance, to take the first example in the 'Check List,' if *Turdus migratorius propinquus* is not *Turdus migratorius*, why not let it stand as *Turdus propinquus?*" To this we answer, because it would be giving

specific rank to what is not a species. "If it is only," continues our reviewer, "a variety of *Turdus migratorius*, why let it stand as a species, on the same footing as the type from which apparently it so slightly differs?" To this we say, it *does not* stand as a species. but merely as a subspecies or variety.* *Trinomials are never used to designate a species;* they always stand for what are commonly called subspecies or varieties. "*Turdus migratorius propinquus*" is only a short way of writing "*Turdus migratorius*, subspec. *propinquus*," or "*Turdus migratorius*, var. *propinquus*." It is so understood by all who use it, and in no other sense. Our trinomials result simply from the dropping of the cumbersome connective "subsp." or "var." commonly used in cases where we employ simply the trinomial. It is not therefore, to borrow the words of our reviewer, "simply to return to the old method that Linnæus is celebrated for having—as we hoped—caused his followers to discard, naming a bird by a diagnostic sentence." Neither has it the remotest tendency or bearing in that direction, either in origin or function. Instead of doing such violence to the Stricklandian Code,—instead of being "both retrograde and misleading,"—it is a device to meet simply and explicitly, in accordance with the *spirit* if not with the letter of that "Code," a condition of things unknown and unsuspected when that, in most respects, admirable system of nomenclatural rules was conceived. Instead of bewailing and denouncing the "evil example of the Americans" in the use of trinomials, we sincerely hope that Europeans will examine into the occasion, basis, and import of this practice, which is believed by those who use it to tend merely to simplicity and conciseness, while it clearly recognises the status and relationship of the subspecific types to which, as above said, it is alone applied.

In consequence of the recent thorough exploration in the interest of Science of nearly every part of our "Great West," it may be safely said that no other equal portion of the earth's surface is so well known ornithologically as North America, and that no amount of material from a like area has ever passed through the hands of specialists. This statement is made in no

* Dr. Coues, it is true, gives it a distinct number, as we think unwisely, and contrary to his and all other previous check lists of North American birds; and in the present case we fear his so doing has aided misconception on the part of the reviewer here referred to.

boastful spirit, but in recognition of the fact that it is the result simply of favouring circumstances, which it is perhaps hardly necessary in this connection to enumerate. It is not therefore wholly strange that the exigencies thereby developed should be imperfectly appreciated by Old World authorities. When similar opportunities for investigating the bird-life of other large areas have been enjoyed, the convenience, if not the necessity, of trinomial nomenclature will be more readily conceded — when intergradations have been traced between many allied forms now held to be specifically distinct; for it is not supposable that North America is exceptional in respect to the matter of geographical variation in animal life under diverse conditions of environment, resulting from differences of latitude, elevation, and climate.

ZOOLOGICAL NOTES FROM GIBRALTAR.

By Capt. E. F. Becher, R.A.

Being at Gibraltar during the spring of 1882—from 28th March to 5th April, again from 24th to 30th April, and from 25th to 30th May—I paid particular attention to the vernal migration of the birds visiting Tangiers, an excellent place for observation. I was grievously disappointed. Olcese, the local naturalist, informed me that he never remembered seeing so few migrants; he had only observed a few stragglers on the well-known plain called the Marshan, which, according to Col. Irby, seems to be "the starting-point of half the small birds which visit Europe." Presumably the reason for this scarcity was the unusual drought in the interior. As an example of the exceptionally dry season, it may be stated that the registered rainfall at Gibraltar was about 17 inches against 56 the previous year.

The sergeant at the signal station at Gibraltar observed very few migrants passing over, and it would be interesting to know the result of observations elsewhere—whether a falling off of the number of migrants was observed in any other locality. The drought, or some other cause, also appeared to have affected the Lepidoptera, for butterflies on both sides of the Straits were unusually scarce, even in the cork woods near the Rock—generally such a favourite locality.

A pair of Bonelli's Eagles, *N. fasciatus*, bred as usual on the

east face of the Rock, the nest being situated on a ledge below the highest point. The female was first observed on the nest on the 28th January; the young were fledged and gone about the 14th May. Only a single pair breed there yearly, for as soon as the young can fly they are driven away, doubtless because the old birds know that the supplies obtainable in the neighbourhood are limited. By the 25th May the spring migration, such as it was, had ended.

On the occasion of one of my visits to Tangiers I noticed rather a peculiar position selected for a nesting-place by a Common Swallow, *H. rustica;* this was inside a small entrance-hall in Bruyeaud's Hotel; a cornice runs round it about two feet from the ceiling; at one of the corners the nest was placed; at night the male used to roost on the cornice about a foot from the nest. The peculiarity about the choice of this position was that it was the most noisy place in the whole house; at one side of the hall was the main entrance, opposite to this the staircase, the dining-room and smoking-room doors being on the other two sides; a large lantern hanging from the centre of the ceiling, which was alwys kept burning till a late hour.

A Squacco Heron, *Ardea comata*, was shot "between the rivers," about four or five miles from the Rock, on the 20th May; Col. Irby says he never observed one near Gibraltar. There were three Crested Coots, *Fulica cristata*, shot in the same locality, the first on the 27th May, the other two a few days later; the plumage of all three was very much worn; Col. Irby "never saw this species in Andalusia." A Kingfisher, *Alcedo hispida*, was seen in the cork woods, near Gibraltar, on the 23rd May; I myself saw one on the 5th June outside the line-wall, between the Ragged Staff and the Waterport; Col. Irby says, "I have no record of its occurrence during the breeding season, *i. e.*, not later than the end of April; the majority arrive in October, leaving in March."

Although the avifauna of the Straits of Gibraltar has been so well investigated by Col. Irby and others, there are still species peculiar to each side of the Straits, the occurrence of which on the other side would be a most interesting event,—*e. g.*, the Blue Titmouse, *P. cæruleus*, is found on the Spanish side, but is represented on the African side by the Ultramarine Titmouse, *Parus teneriffæ;* a similar case is that of the Common Chaffinch,

Fringilla cœlebs, and the North African *F. spodiogena:* while analogous variation is seen in the case of some butterflies. It is curious that under almost similar conditions of existence these variations should be persistent. I am not aware whether the North African Chaffinch migrates South, but it is supposed never to cross the Straits; it thus opens a very interesting question on the subject of migration—that these two birds, (*F. cœlebs* and *F. spodiogena*) should respectively stop short on the very shore of a narrow sea.

The Apes on the Rock had bred well, and it was interesting to watch them on the trees in some of the gardens. On one occasion I saw at least three very young ones with them, and I particularly noticed the way in which their mothers carried them—which as a rule was on their bellies, the young ones holding on with their feet and hands as their mothers jumped from branch to branch; sometimes the mothers holding them with one hand, but usually the little one had to cling on unaided; sometimes they were carried on their mothers' backs.

As regards the land shells of Gibraltar, from information I have gathered and from my own observation, there are twenty species found on the Rock, of which *Pupa calpeana* is supposed to be found in no other locality. The following is the list:—*Helix aspersa* (Mull.), *H. acuta* (Drap.), *H. pisana* (Mull.), *H. marmorata* (For.), *H. luteatâ* (Parr.), *H. sherzeri* (Geleb), *H. lenticularis* (Morel), *H. conspurcata* (Drap.), *H. hyalina*, *H. coquandi* (Morel), *H. lactea*, *H. apicina* (Ferr.), *Ferrusaica vescoi* (Morel), *Bulimus truncatus*, *Pupa calpeana* (Wester.), *Cyclostoma elegans*, and four unnamed; a white variety of *H. lactea* is also found at the highest part of the Rock. In summer every twig and dried remains of herbage is laden with *Helices*, chiefly if not all *H. pisana*, the fierce heat of the sun apparently not harming them; of the above list all but *P. calpeana*, and three of the unnamed ones are more or less common. I cannot suppose that the list is complete, but that if the gardens were thoroughly searched, containing as they do a number of imported shrubs and plants, some new species would be found. In conclusion I would add that, uninviting as the Rock of Gibraltar looks, especially in summer, yet to those interested in any branch of Natural History there is a ready field for their investigation. Well worked as the Ornithology of the Straits has been by Col. Irby and other

naturalists, it is still far from being exhausted. To trace the connection of the rock with Africa, in regard to species of any class, would be another interesting study.

ON THE TREATMENT OF SNAKES IN CAPTIVITY.

By Arthur Stradling, C.M.Z.S.

(Continued from p. 68.)

Snakes can be kept warm in a box unprovided with any such mechanism by movable tins of hot water, or, better still, by an india-rubber water-pillow, though there are great disadvantages attending each. Here the same principles hold good; the larger the vessel the longer will it continue to evolve heat, one being preferable to two of half its capacity, unless no obstacle exist to the two being refilled at very short intervals; here, too, it will be necessary to wrap up the tins, not only for the purpose of economizing the heat, but to prevent the snakes from burning themselves. Care must be taken not to run into the opposite extreme, and cover them so thickly that the heat is all kept in and the poor reptiles get none of the benefit of it. That is the reason for choosing coarse earth for our tray; a fine, close powder would be too perfect a non-conductor. The tin or pillow may be cased in a flannel bag, but should rest upon some material which will prevent evaporation from below, since whatever heat goes off in that direction is wasted; a pile of tightly-pressed newspapers is as good as anything. If a tin is chosen, a square shape is best, the upper surface just large enough for the serpents to coil upon, with rugs over all; *they* will find out where the greatest amount of radiation is taking place, to a degree.

In arranging some rough paraphernalia for an attempt at artificial incubation with snakes' eggs, I once fell into this error of over-precaution against escape of heat. A tin holding six gallons of boiling water was so completely shielded that at the end of seven days it was scarcely possible to bear the hand upon it when it was unwrapped, while the eggs were cold and dead. This system is adapted to several articles of manufacture for domestic comfort and convenience.

A cover of flannel or quilted stuff, the thicker the better, should be provided for the vivarium, and always put on at night;

it ought to be well-fitting like a garment, but the four sides may have free borders unattached to each other, only joined—hinged, as it were—to the top piece. Thus, when the "cosy" is on, the edges will be in apposition and the cage perfectly covered, and at the same time it allows one or more sides to be turned up to admit light during the day; for it is often advisable to partially shelter the glass in this way, and effects a vast saving of heat. If the cage stands, as it probably will, at the window, then the zinc top and the two ends only must be covered, the front and back squares being folded above, to prevent the room being darkened, as well as to afford a view of the reptiles—always let them see, as well as be seen. If, however, it stands in any other situation, then it will be enough to turn back the front portion alone; but if the cage is not designed to transmit the light, it is just as well to have the back (and perhaps the ends, too) made of wood or metal. The use of the cover will naturally vary with the season, and according to incidental circumstances affecting the local temperature.

The ordering of the interior of the cage will be discussed when we come to consider that topic generally. There must be a forked branch, of course, of suitable size, as in the den last described; one end can be fitted into a hole of the perforated floor, while the other may be secured to the zinc at an angle of the top with wire or a rivet. A pan of water will take the place of the tank, and the only thing that need be said about it here is that it should not be put in until the sides of the cage are thoroughly warmed—otherwise the vapour which it will be impelled to throw off by the heat below will condense and cloud the glass. Tepid, not cold, water is to be introduced when the pan is refilled, as it should be every day. The kinds of snakes which may be kept in such a cage will also be allotted to a separate chapter; but I may remark in this place that when it is intended to contain young constrictors, of large and powerful species, the sides must be made of plate-glass.

A small orange-tree, fuchsia, geranium, or other plant with tolerably sturdy stem, has a very pretty appearance in such a case with Green Whip-snakes, or any whose habit of body is excessively slender, like the Tree Snakes proper; but does not do for bulkier reptiles, even if the branches will support their weight. Coming out of the water, they glide and burrow about

the earth in which it grows, thus acquiring a coat of mud which they transfer to the gravel and bath, and smear about the glass. Such an arrangement, however, is well suited to serpents belonging to *Philodryas*, *Herpetodryas*, and allied genera, which live almost entirely among the leaves, their long lithe bodies twining gracefully in and out between them, and scarcely distinguishable when at rest by the unaccustomed eye. As a rule, "pretty" effects are to be mistrusted, where snakes are in question. A crystal vivarium, with beautiful serpents roaming and climbing about within it, is quite handsome and striking enough, if kept clean, without the addition of any adventitious decorations. Allusion has already been made to the stucco rock-work and mirrors displayed in the four reptile-cages opposite the Lions in the Antwerp Jardin Zoologique—*et prætereа nihil* in some of them, very often!—but the most atrocious cruelties are perpetrated to obtain picturesque and *bizarre* effects. Unhappy snakes have been compelled to writhe in a narrow interspace between two sheets of glass as window-transparencies and fire-screens; have been prisoned in tubes of water surrounded by flowers; and have fretted their lives away in miserable little bowl-shaped shades, made to cover stuffed birds, hanging on drawing-room walls. Some writers have even asserted that the inhabitants of certain countries *wear* them commonly as bracelets, necklaces, and even as earrings, passed bodily through the lobe of the ear—a statement which requires a good many grains of the chloride for its deglutition when we remember the universal horror with which they are regarded in every country by the only class likely to be guilty of such a practice, the impossibility of retaining them in such a position, and the certainty of their biting if they could be so retained. Still, the point is not of much moment here, since I presume that the reader will value his serpents rather as materials for the study of Ophiology, than as the means for indulgence in personal adornment.

It is usually advantageous to keep newly-born snakes of all species in feeding condition through their first winter in captivity, even if they belong to a comparatively cold habitat, and adults of the same kind are allowed to hybernate. For these, or for any tiny snakes of a few inches in length, especially for a single specimen of some brilliantly-coloured, rare, or delicate serpent, a smaller and

more easily managed hot cage may be contrived with very little expense. An ordinary gold-fish globe, or vase, is filled with fine gravel, or coarse sand, up to the level of its largest diameter, and furnished with a small saucer or pot, buried to to the rim, for water, and a miniature tree. Over the top a piece of muslin or stout gauze is passed; this may be loose and baggy in the centre, so as to permit the tree to extend above the top of the globe, and thus increase the space for exercise; but it must not be forgotten that this elevated part will practically be in the open air as far as warmth is concerned, and in any case the gauze is to be fastened very tightly under the everted brim—an ordinary elastic band is not strong enough. The globe, now complete as a cage, should rest upon a cylindrical hot-water tin, whose transverse diameter is not less than the greatest breadth of the glass. This tin may hold about four gallons, and must be concave at its upper end in such a way that the globe sinks into it to the level of the surface of the gravel, the convexity and concavity being adapted to each other as accurately as possible. A very thin piece of flannel may interpose between the glass and metal, but the tin (which will require refilling with boiling water about once in thirty-six hours) should be thickly enveloped in felt. A circular imitation rockery, to mask the tin, can be constructed of cork, and will pass on and off over the top like a ring; or, if rather elaborate and stocked with ferns, may be left undisturbed, and the apparatus put together within it, or removed piecemeal as required. This has a highly ornamental appearance, and involves no sacrifice of proprieties. I have used a glass clock-shade for a similar purpose, but it is a very awkward arrangement; if anyone should adopt it, they had better take off the little feet on which the stand rests, so that, whether it be kept on the mantelpiece or upon a water-vessel, the under part may lie flatly upon the warm surface.

We may now consider the accessories incidental to the conservation of serpents which will thrive under ordinary climatic conditions, and require no increase of temperature; and it is to this section that I most especially and hopefully devote myself—not only because it appeals to the greatest number of amateurs in this branch of Natural History (from the school-boy who snatches a fearful joy in contemplation of a contraband grass-snake in his desk, upwards), but because the observations made

under circumstances which are as little as possible influenced by artificial surroundings are far more trustworthy than any which can be conducted in heated cages. I write here, keeping in mind our English atmosphere and using our own snakes for illustration; but the remarks will bear reference equally to the serpents of any country, tropical, subtropical, or temperate, studied in their native habitat. Furthermore, a big snake presents no special characteristics which render it preferable to a small one for most scientific purposes; and no one will doubt that a common grass-snake or adder will offer many opportunities in its own territory for records more valuable to science than anything which can be gleaned from the largest Boa Constrictor, or other ophidian immigrant, whose existence is maintained in an abnormal environment.

The construction of a vivarium for this class of serpents obviously admits of the greatest variation. One must aim at obtaining the utmost facilities for gaining a constant insight into the phases of their changeful life, consistent with altering the immediate relations of that life in no way prejudicial to the creatures themselves; avoiding the rock of raree-show "prettiness" on the one hand, nor plunging on the other into the whirlpool of ultra-conformity to "Nature," which will engulf all chance of ever making an observation at all. This latter evil is exemplified to some extent in the terrarium established in the beautiful gardens of the Zoologische Gesellschaft at Hamburg. It is a large and handsome structure, situated in the open air; the sides are entirely of glass, and it contains a tasteful display of shrubs, ferns, and mountainous rockeries with miniature cascades, &c. All very natural and homelike for the snakes, but somewhat disappointing to the visitor who comes to look at them, since not a tithe part of the number it houses can ever be seen at one time. A great many of the European species are said to be represented in this terrarium; having no heating appliance, it is half-filled with dead leaves for their protection all through the long and severe winter, owing to its exposed position. The welfare of an animal in confinement does not demand for its provision so close an adherence to its native *Lares et penates* as this, which would indeed be exceedingly difficult to carry into execution with brutes of larger growth.

A friend of mine, living in the West of France, some time ago

determined to investigate the habits of common snakes under what appeared to him to be the most favourable circumstances, by keeping them in an enclosure upon his lawn, wherein they might be considered to live in a perfect state of nature. A circular space, between sixty and seventy feet in circumference, was surrounded with a wall four feet high; the foundations of this wall were dug to a depth of three feet, to preclude the possibility of any reptile burrowing its way beneath it to the outer world; for no trouble or expense was spared to insure completeness in every detail by the designer. Part of the ground was planted with thick, coarse grass and rank weeds, while the rest was left bare; there was a huge pile of rustic wood and stone in the centre, to hide a mound of rotting vegetable matter, accessible to the snakes through the interstices of the rockery; and a small pond gave lodging to an abundance of live food in the shape of frogs, fish, and newts. The wall was plastered smooth as glass on its inner side, all overhanging or undergrowing boughs and stems were cut away, that no prisoner—if prisoners they could be called—might find the means of escape, and the snakes were turned in, scores, if not hundreds of them; grass-snakes like ours, for the most part, though other kinds indigenous to the continent, of which shall afterwards make mention, were there too. It was a great success—for the snakes; they did remarkably well, as might be expected in such luxurious quarters, fed well, bred well, but were scarcely ever visible. If one walked stealthily up to the wall and peeped over, there might be time to note two or three indistinct objects flash away into the tangled bush with an angry hiss, certainly; but neither this nor going in amongst them and stirring them up from their jungle, where they lay matted like the blades of grass, could properly be termed studying their habits in a state of freedom. I am afraid the very pretence soon dwindled down to an undisguised sensational exhibition to guests at night; the wall was surrounded as quietly as possible in the darkness, and and the light from several *lanternes sourdes* suddenly turned on. It would be some moments before the snakes, lizards, and frogs, bewildered by the illumination in the midst of their nocturnal rambles and avocations, contrived to stow themselves away; and the whole enclosure presented a creeping, leaping, hissing, slimy nightmare for herpetophobic people to shudder at. If

reptiles bore a high commercial value, the place might have proved a capital speculation as a nursery; the eggs deposited in the rotten leaves were hatched freely, and in the spring swarms of little serpents might be seen about the stones on a sunny day, or surprised in pursuit of tadpoles and newly-emancipated frogs after dark. And from these young ones was gathered perhaps the only result of the costly experiment—an answer to the question often asked, Why are snakes not more numerous?

All these creatures are very prolific, whether ovo-viviparous or oviparous. Boas, vipers, and various colubers belonging to the former class which have bred in menageries, have given birth to batches of fifteen, twenty, thirty, or even a greater number; and in those cases where less have been produced, there have usually been indications to show that many more ova have never reached maturity, as they probably would have done had the mother remained undisturbed in her native wilds. Our common English Snake lays from twenty to fifty eggs at a time, and it may reasonably be conjectured that most, if not all, that are laid are hatched; the parent's instinct leads it to deposit them in some situation favourable for their germination, and the eggs themselves are not exposed to the depredations that imperil the contents of a bird's nest. Yet the snake is a reptile comparatively scarce in our midst, and does not increase fifty, twenty, or even twofold in localities where they are unmolested by the hand of man. My friend found an explanation of the fact in the many animals which devour them greedily, in addition to their well-known enemies, mongooses, pigs, storks, and pike. Any bird or fish that will eat a worm will take a snake of corresponding size; and, curiously enough, the very things upon which they feed when they are big enough, seem to prey upon them with an avidity which one might fancy inspired by an impulse of self-preservation—thus, frogs, lizards, and tritons which had been intended to furnish the larder, took a dietetic revenge on the early snakelings. Toads, hedgehogs, and even slow-worms made away with them, while flocks of birds by day, and rats, stoats, weasels, polecats, and other small deer at night were undoubtedly attracted to that happy hunting-ground, to the notable diminution of its ophidian population. After a while snakes began to appear outside the enclosure, about the lawn and shrubberies, and it was supposed, since not the tiniest

aperture could be discovered, that they were carried over the wall by marauding cats and fowls. Finally, two large Black Vipers having been added to the collection, a panic seized upon the household, which communicated itself to the host at length; no one would venture within the circle any more; and a couple of pairs of Peacocks, the most determined of ophiophagists, were permitted to wage a war of extermination upon the remaining reptiles.

This is rather a digression from our subject; but I relate the incident to show how unsuitable an arrangement which would at first strike one as being admirable, on account of its fidelity to Nature, may be for the work of observation. (I intend, however, to turn a number of Common Adders into a large walled manure-pit in a stable-yard, and see what I can make of them there, as they yield less satisfactory results and are more difficult to keep in confinement than almost any other serpent). Small glazed ferneries are sometimes used as reptile-cases; but, as I remarked in the last chapter, it is impossible to combine snakes and botany, except it be in one or two peculiar instances, hardly likely to come within the scope of amateurs; while if the fernery be utilised exclusively as a reptilium, it will combine the maximum of expense with the minimum of convenience to be expected in such an apparatus. The objection applies equally to the dome-shaped structures which replace the lower sashes of windows, and the oblong, pyramidal-topped articles adapted to stand upon a table or decorate a green-house; to purchase an aquarium for the purpose is simply throwing away money. Here is a model which I can strongly recommend for cheapness and efficiency.

Suppose an ordinary four-legged table to be turned upside down. Let the top (or rather its under surface), now resting upon the floor, represent the bottom of the cage—the only solid part about it. Ridiculous as this method of illustration may appear, you had better make use of it when giving your instructions to a carpenter; for no matter how skilful a draughtsman you may be, you will find it very hard to combat all his preconceived notions of architectural propriety, and to impress his understanding with the kind of thing you want by a plan; but a cribbage-board with long pegs may be tried. To revert to our inverted table—lay four bars of wood upon the

extremities of the upturned legs, so as to complete the frame; imagine one of the two long sides to be glass, and the other, the top, and the two ends to be covered with canvas or wire-gauze; and there you have, roughly sketched, the sort of receptacle which I have found to answer excellently in every climate for the snakes proper to it.

Both floor and frame ought, of course, to be made of good, seasoned wood; the former should be riddled with plenty of small gimlet-holes and be supported on two or three battens, about an inch in thickness, if it is intended to stand upon a solid surface, to meet the possible requirement of drainage. Wood is to be preferred to metal for this cage, since it is warmer in its contact with the snakes, while no extra heat holds out an inducement to insect pests to take up their abode in it, as in the two former constructions. The frame must be stout enough to carry the glass and nails, but does not call for any great strength beyond this: the lower part should rise about an inch or an inch and a half above the level of the floor all round, to keep in the gravel. The uprights, and indeed every part, ought to be plain and square, without turning or ornamentation of any kind; if anything of the sort exists on the inside, it must necessarily leave chinks and spaces which will harbour dirt and tempt the snakes to explore. Window-glass will probably be employed for the glazed side (it is quite strong enough) instead of plate; and, to avoid the dangers attendant upon unduly large panes, an additional upright support must be allowed to every twenty inches, or two feet, of the length of the cage. A corresponding pillar to match this should be erected on the opposite side, and the two joined across the top by a transverse beam, like the ends, as the canvas or gauze will also require extra supports to maintain its tension, in proportion to its length. It will be observed that I say nothing as to the dimensions, because they depend upon precisely the same circumstances that were cited before, and the same rules of comparison with the size and number of the creatures for which it is destined to hold good. Having thus completed the floor and front (the glass side), the back and top will not take long to finish, since they merely require to be filled in with stout canvas, such as meat-safes are made of, or with wire gauze which is used for similar purposes. Of the two, I must say that I infinitely prefer the former. It admits more light, is

equally permeable by air while it excludes dust more effectually, does not corrode or become clogged, is far less expensive, and can be easily renewed at any time—though, as far as I can see, it is practically as durable as the wire. Moreover, the snakes do their mouths no harm in pressing against it, as they would be apt to do with the other material. I have had some in constant use for five or six years, and find it in as good condition, with regard to utility, as it was when first nailed on; nor has it stretched or slackened to any appreciable extent. It can be washed, and even scrubbed; but all that will be necessary, as a rule, is an occasional dusting with a clothes-brush, within and without. It ought to be supported, in a cage of very large dimensions, at intervals of half a yard or two feet, like the glass, —nailed, that is to say, not merely drawn over an intervening beam,—otherwise it may lose its tension. And take particular care that it is fastened as near to the edge of the woodwork as possible, so that no interval is left for the inmates to wriggle their heads or bodies into; where a piece of canvas passes across any part of the framework, upright or horizontal, it should be nailed firmly to *both* margins of the support, the two squa[illegible] thus becoming practically separate pieces, independent of other. The extreme obnoxiousness of any interval of [illegible] adherence between the woodwork and canvas is very soon apparent when any such exists at the lower border; no matter how tightly the stuff may be stretched, the gravel will become wedged there by the persevering efforts of the serpents, and will be next to impossible to dislodge without injury to the canvas. Fix it close to the edge, then, and do not spare the tacks—three to the inch will not be an extravagant allowance.

If these items of advice seem tediously minute, I would invite the reader to notice that none of them are unimportant. His object in building a cage is to keep live snakes therein. [illegible] it would be vexatious to find that object frustrated by their escape or injury through the want of a tin-tack in the right place when all is finished. I wish to spare him the annoyance of finding these things out for himself by experiences which can only be untoward. A serpent-cage is not a recognised article of commerce. One cannot order it to be made, like a dog-kennel, without any further directions about details than its size; nor send to an ironmonger's or a fancy-shop and get a new one if it

nswer, as one might for a canary. The importance of nall matters has been revealed to me by a series of r lack of them.

still the two ends to fill in. For these, two frames ade of the exact size as the ends themselves, covered like the back and roof, and fastened with hinges to s to form doors, lying against the exterior and lifting elow. (It is hardly necessary to say that the canvas ere lies *outside* the frame). If these hinges are properly ed, the doors may be turned up till they rest by the upper rface of their frame on that of the cage, and will stand in that osition without support, which will be found an immense convenience during any manipulation in the interior. There must be a button, bolt, or ring and staple fastening at each corner below. Where the length of the cage does not exceed two feet, one door will be sufficient, the other end being simply covered with canvas; where the breadth exceeds three feet, there had better be a division in the middle of each end, and the door ccupy only the half which is nearer the glass. No tray will be equired, since the facilities for cleansing the gravel are so great. A sliding panel, to divide the interior into two compartments, is very easily contrived, if circumstances render it advisable.

Such a cage stands at a window of the house in which I write. It is 3 feet 6 inches long, 2 feet 6 inches broad, and 2 feet 6 inches high, the glazed side containing two panes. A well-branched "tree" springs from the floor, near the glass at one end, and slopes upwards to the farther angle at the top of the other. The frame and floor are made of white deal, the former being stained and varnished on the outside in imitation of satin-wood; and the whole, complete, cost £1. I cannot give its exact weight, but when furnished with gravel and pan of water I can just lift it without assistance from the small table on hich it stands and carry it to any part of the room, In this cage are five snakes—European and North American Colubers, of hardy species; the largest four feet in length, the others being about three feet, two feet and a quarter, twenty-one inches, and eighteen inches, respectively. The glass side looks towards the centre of the room, of course, and the canvas back is close against the window. The cage itself is almost as light as if it were glazed on every side; while, since only the one layer of

translucent canvas intervenes between the window and the apartment, the latter is not darkened by its presence as much as it would be by an ordinary bed-chamber muslin blind. This window opens upon the road, and though the eyes of passers-by cannot penetrate the white canvas wall (a *very* important point in boy-infested neighbourhoods!), everything that goes on outside is visible from the interior, while every movement of the reptiles can be observed at leisure from any part of the room.

If it be intended to introduce hot-water tins into this kind of cage in the winter, a felt or quilted cover, such as was spoken of in the last chapter, must be made to go over it. It is ill adapted for such an arrangement, however; and I infer that those who make use of it will either remove their snakes to another situation in cold weather. or allow them them to go into a state of hybernation with the appurtenances to be afterwards described.

(To be continued.)

NOTES AND QUERIES.

The Fauna of Higham, Kent.—In a little volume, entitled "A Handbook of Higham; or, the Curiosities of a Country Parish" (1882), for a copy of which we are indebted to the author, the Rev. C. H. Fielding, M.A., we find a chapter headed "Natural History," followed by lists of the animals and plants found in the district. Judging by the length of these lists, the author appears to have paid more attention to botany than zoology, although, as he tells us, "considering the great centre of population in which the parish of Higham is situated (between the Thames and the Medway), and the amount of cleared land in the parish, the fauna is very extensive." Amongst the few interesting mammals noticed are the Badger, which has been "frequently found," the Harvest Mouse, and the Horseshoe Bat, concerning which we should have been glad to see something more than the bare mention of the name. The Polecat is doubtfully included in the list, and although the parish lies between two rivers, the Otter is said to be unknown there. In the list of birds, wherein 88 species are named without any intimation of their being resident or migratory, rare or common, we observe Montagu's Harrier placed on equal footing with the Barn Owl and Sparrow Hawk, as if it were equally abundant, and we are left to guess what particular species (out of the half-dozen or so which are found in the British Islands) may be intended by the vague expression "Wild Goose." Amongst the Amphibia the only species

calling for remark is the Natterjack Toad, which has once been procured in the parish. Higham, it appears, "can boast of few fish except those which, swimming in the Thames, are caught by Gravesend fishermen," and the author, who refers very briefly indeed to the local Crustacea, has nothing to tell us about the Land and Freshwater Mollusca, of which we should have supposed that the adjacent marshes would have yielded some interesting forms.

Yorkshire Lepidoptera.—All who are interested in the working out of the geographical distribution of animals will be prepared to welcome the list of Yorkshire Lepidoptera which Mr. Geo. T. Porritt, F.L.S., of Huddersfield, has been preparing at the instance of the Yorkshire Naturalists' Union, in whose 'Transactions' it will shortly appear, being now in the printer's hands. Assistance having been given by Yorkshire collectors, and full attention paid to the extensive bibliography of the subject, Mr. Porritt has written what is probably the best county-list of Lepidoptera in existence. It includes 1344 out of the 2031 known British species, or a proportion of about two-thirds.

MAMMALIA.

Food of the Hedgehog.—I am able to corroborate the statement of your correspondent (p. 25) as to the sucking of eggs by the Hedgehog. One I kept in my garden for some time last summer contrived to get into the hen-house, in which one of the hens was sitting on thirteen eggs, which disappeared one by one until three only were left. The hen then forsook them, and a day or two afterwards I found the Hedgehog in the nest-box, half buried in the straw, and two or three of the remaining eggs broken.—C. Young (Llandaff).

Otters and the Floods.—The extreme wariness of the Otter and its nocturnal habits have probably often caused it to escape notice, or at least to be looked upon as a rare animal in many districts where it is not really uncommon. But here, at any rate, I think I have good reason to regard it as scarce, for till last October I had not for years heard of any Otter having been killed near this town, either by the hounds or otherwise, and though I have been constantly, and at all hours, on the banks of the Waveney, I have found very few traces of the presence of this animal. The fact, therefore, that during the last few months several Otters have been observed in the river, or the dykes connected with it, is I think worth noting. Like the rest of the county, we have suffered all through the autumn and winter from the excessive rainfall, and all our low-lying meadows have been repeatedly inundated. These high floods must have driven many Otters from their river-bank securities, and this may account for their unusual appearance in the open river. The thick and muddy

condition of the water, too, for weeks together has, I suppose, made it difficult for them to procure their usual food, and being pressed by hunger they have lost a good deal of their natural shyness. Besides others seen I have, I am sorry to say, the following notes of animals killed:—In the beginning of October an Otter was taken in a dyke at Mendham, in Suffolk. A man gathering bullaces in a cottage-garden by which the dyke runs heard a great uproar among some ducks feeding in the water, and looking up saw them fluttering in a body up the dyke closely pursued by the Otter. Before the animal could make its escape the man disabled and then killed it with a few blows on the head from a pole. This happened at a frequented spot, and only a few feet from the high road. I did not see this Otter, but was told it was a young one, not full grown, miserably thin, and out of condition. About the same time three others were seen together, early one morning, at Needham, in Norfolk, a little higher up the river, by a man out with his gun. Two of these he shot, and his dog brought them out of the stream. The third, which he said was a larger animal, fortunately got away unhurt. They measured in length 31 in. and 29 in. (or exclusive of the tail 21½ in. and 20 in.) respectively. Again, on January 4th, and very near the same place, but in Weybread, on the Suffolk side of the river, a whole family of these animals was sacrificed An old Otter and three young ones were discovered in a ditch connected with the river. The mother was shot, and the young ones killed by a dog. The latter were lying under a large heap of flags and weeds; they were apparently only a few days old, being quite blind, and so must have been born in mid-winter. The destruction in such a way of seven Otters in a few months, and in one short stretch of river, is greatly to be regretted. The Waveney here is well stocked with coarse fish, a few of which might well be spared for the Otters by our anglers, who generally have good sport.—C. Candler (Harleston, Norfolk).

Hairy-armed Bat in Co. Fermanagh.—It is as well to record in the pages of the 'Zoologist' the occurrence of the Hairy-armed Bat, *Scotophilus Leisleri*, at Crum Castle, Co. Fermanagh. In June last year I found this Bat in great numbers in the roof of the boat-house there. It is far commoner in Ireland than was once supposed. See 'Zoologist.' 1874, pp. 4071, 4236; and 1875, pp. 4419, 4532.—Richard M. Barrington (Fassaroe, Bray).

BIRDS.

The Meaning of English Bird Names.—Referring to Mr. H. T. Wharton's article on this subject (Zool. 1882, p. 441), I may remark that "Hern" and "Erne" are obviously the same word, and from the earliest times there has been an association in language between the two classes of birds, viz., Herons and Eagles, though perhaps the latter class, and especially with reference to Egypt, should also include Hawks. On the

principle that $l = r$, we can trace a connexion between the various names for "eagle," such as *aquila* (Lat.), *aigle* (French), etc., and the various names for the heron tribe in which a guttural letter appears, viz., *hiegro* (old High German for *heron*), *egret*, etc. The initial aspirate is of course of little philological value, while the guttural *g* or *q* in the centre of a word is probably of not much greater consequence in a question of roots. Thus on the one hand we have two sub-classes of names, apparently derived from a common root, where the letter *r* denotes the heron tribe, and the letter *l* the eagle tribe; on the other hand we have the two tribes of *eagle* and *heron* meeting in the old English *hern* and *erne*. It would be very interesting to many ornithologists if Mr. Wharton would try to trace the connexion in language between the eagles and the hawks; at any rate I can inform him that the old spelling of *hawk* was *haulk*, just as the Latin name for the marine *auks* is *alca*. The marine "auks" are probably so called from the analogy of their hooked beaks and wise-looking heads to those of the "hawks" on shore. Mr. Wharton is quite right to point out that the Saxon form of *hawk* was *havoc*, which is simply *hawk* with an *o* interpolated between the two last letters. But having done so, is it not most remarkable that he does not see the plain fact that *avocetta* is nothing more than Italian for "little havoc" = "little hawk or auk"? *Avis casta*, or "chastely coloured bird," is too far-fetched; the avocet is merely "the little hook-billed bird," with the hook turned up instead of down. [With regard to the derivation of the name avocet, there is yet another suggestion to be made, namely, that the word (a diminutive) may be derived from *avoco*, *avocare*, to call out, bearing in mind the noisy cry of this bird, and the fact that it was once provincially called "barker" and "yelper" in days of yore when it used to breed here, and was well known to the fen-men.—Ed.] If we go further, and besides admitting *l* and *r* to be transmutable also adopt the method of transposition, it becomes very probable that the words in which the liquid precedes the guttural, as in *alca*, *haulk*, *falco*, &c., are from the same root as the words in which the guttural precedes the liquid, such as *aquila*, *eagle*, *egret*, &c. The terminal *n* and anteterminal *o* in words like *hiegro*, *heron*, *falcon*, &c., probably derive their origin from mere euphony—also I think it will be admitted that initial aspirates, or intermediate gutturals which are a sort of rough "breathings," make no difference to the root which appears to rest on the liquids *l* and *r* for its pivot. *Hiegro*, deprived of its guttural, appears to indicate a connexion between the herons and the hawks or falcons, e.g., *hierax* (Gr.) *gier-eagle* and *jer-falcon* (Engl). My only real doubt is whether the words beginning with a sibilant *s* are from the same root. In Greek we have *hieros* = sacred, *hierax* = hawk. In Latin we have *sacer* = holy or sacred, and the falcon has always been called *sacer*, *saker*, or *sakr* in the language of European and Arabic falconers. Substituting *l* for *r*, and

leaving out the initial *s* (as the French do before *p* and *t*, e.g., *épine* for *spina*, *étude* for *studium*), is it reasonable to suppose that *aquila* = *falco sacer* and the Arabic *sakr*? Is it possible that in the religion of old Egypt the idea of sacredness may have been named from the hawk, and not the hawk from the idea of sacredness? We know that the moustached hawk, either lanner or kestrel, or both, was sacred. But Mr. Massey thinks the *purple heron* was also reverenced as the *phœnix* or purple bird. Is it possible that here we have the key to the immemorial connexion between hawk and heron, eaglet and egret? With regard to the suggested derivation of "bustard" from *avis* "*tarda*," if that be correct, how does Mr. Wharton derive custard, gustard, and mustard? My own theory is that bustard, buzzard, bittern (= büttern) are all one and the same word, and mean "the yellow-brown bird." *Buteo* = buzzard in Latin, and *butio* = bittern. Butter = yellow milk. With bittern compare the French "bistre." On this theory "butter-bump" would mean "the yellow booming bird," and the Devonshire men, who called bustards "turkey-buzzards," would deserve the thanks of philologists. On no other hypothesis but colour can I account for the similarity in name between *buteo* and *butio*, the buzzard and the bittern.—CLIFTON.

Dipper singing during severe Frost.—I am able to corroborate what Mr. Mathew has said (p. 79) on this subject. On the 13th December last the thermometer was said to have registered twenty-six degrees of frost in this country. A bitter north wind was blowing over a country covered with frozen snow. Rooks and other birds had that mute look of despair they assume in severe frosts. I was walking along a trout-stream named the Finisk with my gun, and a Dipper had flown on before me. At 3.45 p.m., the sun having just set, I approached a bend in the river, when I was amazed to hear a bird warbling sweetly near me. I paused and the song went on; not a loud song, but very sweet. I drew closer to the bend, when from the bank near me up flew the Dipper I had been listening to, and flew back over my head up-stream, uttering its Stonechat-like warning-note. On the 22nd December the Rev. W. W. Flemyng wrote to me, "I heard the Dipper singing to-day, in Curraghmore, a very sweet melody." Doubtless this species finds no difficulty in obtaining its prey, molluscs, &c., beneath the running water of brooks when the ground is frozen like a stone, and other birds are starving, so that it alone is cheerful under such circumstances. I took a Dipper's nest containing five eggs, on the 8th April last, that was placed on the iron shelf formed by a flange of the girder of the railway-bridge over the above-named Finisk River. This shelf, with the nest on it, faced inwards beneath the bridge and overhung the water. The bird, which was hatching, continued to sit though I drummed with a stick on the iron girder behind her, and only left the nest when approached with a ladder. A second

nest was subsequently formed last spring in the same position. Another had been constructed two years before on a flange of the same bridge, but that first nest was within reach of the bank, and was destroyed.—R. J. Ussher (Cappagh, Co. Waterford).

Siskins breeding in Confinement.—It may interest some of your readers to know that during the past summer I succeeded in getting my two pairs of Siskins (which I keep in large cages) to lay, and one of them to rear young ones as well. Although I have kept Siskins for several years, I never succeeded in inducing them to breed before. I am, however, aware that there are many instances of these birds laying when kept in confinement, but I only know of one where the young were hatched and reared. The first pair repaired a nest and laid two eggs on the 7th June; the hen then began to sit, but I took the eggs away shortly after, expecting she would build again and lay the full complement of eggs. She did not, however, do so. The second pair relined a nest in the same manner as the other, but did not lay until July 17th. Four eggs were laid and three young ones hatched in eleven days. The young when first hatched were covered with black down, but after the first week grew rapidly, and at the end of a fortnight were able to leave the nest. They were fed by the hen bird on the pupæ of gentles, hard egg, and the seeds of various composite plants. All lived to be a month old, when one died. The survivors are both cocks, lively healthy birds (one of them acquired a black chin by the 26th November) and resemble the wild bird in all particulars, except that the legs were always light-coloured.—C. Young (Llandaff).

[Some interesting remarks on the breeding of the Siskin in confinement, by Mr. John Young, will be found in 'The Zoologist' for 1880, p. 61.—Ed.]

The Birds of Lancashire.—I have for some years been working at the 'Birds of Lancashire,' and am anxious to make the list as complete as possible. The value of local lists of birds is generally recognized; and I need not, therefore, apologise for attempting to bring together in a collected form, up to the present date, the ornithological knowledge of my native county. Lancashire ornithologists, though numerous and intelligent, have, unfortunately, seldom published their observations; and the quantity of material ready to hand is much smaller than is possessed by other counties. Thus, to make the work complete, it is the more necessary to have full information from those acquainted with every district. If any of your correspondents are able to assist me, I shall be pleased to furnish them, on application, with the particulars on which I desire information.—F. S. Mitchell (Clithero, Lancashire).

Rare Birds at Harwich.—A Gray Phalarope was shot on the 3rd November last whilst swimming in the harbour, and another was seen. A Little Bustard was seen on the 21st November. It frequented the large

fields of Ramsey and Little Oakley for more than a week, and escaped the many attempts made to shoot it. A large flight of Shore Larks arrived on this part of the coast, and frequented the salt marshes. No less than thirty-five were shot. A single specimen of the Waxwing was seen on the 13th December in a garden at Dovercourt.—F. KERRY (Harwich).

Bonaparte's Gull at St. Leonards-on-Sea.—About the month of July, 1876, I was looking through an interesting collection of birds belonging to Mr. F. Pershouse, of Torquay. Amongst other specimens I particularly noticed a small Gull, which I could not then identify. However, I luckily took some notes of it. A month or two ago I got an American skin of Bonaparte's Gull, *Larus philadelphia*, from Mr. Marsden, the dealer, at Gloucester. This skin at once put me in mind of Mr. Pershouse's bird, and on referring to my notes of that specimen I found they agreed very closely with the skin which I had received. As Mr. Pershouse was lately making some alterations in his cases, he very kindly took the bird out and sent it up to me for identification, and on comparing it with the skin above mentioned and with another which Mr. Howard Saunders had kindly sent me, I found it to be without doubt *Larus philadelphia*, in immature plumage, and in the same state of plumage as the centre bird in Yarrell's figure. Nor can there be any doubt about its being a British-killed specimen, for Mr. Pershouse shot it himself. The following is his account of its capture:—"It is some years since I shot it, and I cannot supply the exact date, but it was early in November, 1870, at St. Leonards-on-Sea, at the western extremity of the parade. It was with a number of Black-headed and Kittiwake Gulls. I mistook it at the time for *Larus minutus*, and remained under that impression until your visit." It is a young bird, with some of the dark markings on the wing which probably led to its being mistaken for an immature Little Gull. For an adult Little Gull, with its white primaries, it could never have been mistaken. It is by no means a common Gull in the British Islands. Mr. Harting, in his 'Handbook,' enumerates only six British specimens; and Mr. Rodd, in his 'Birds of Cornwall,' mentions one other Cornish specimen besides the one referred to in the 'Handbook,' but beyond these I have not been able to find another recorded instance of a British-killed example. Mr. Pershouse's specimen, therefore, is only the eighth reported. It may be well, perhaps, to point out some of the distinctions between Bonaparte's Gull and the immature of *Larus ridibundus* and *Larus minutus*. It is intermediate in size between the two, but the markings of the primary quills will serve better to distinguish it than comparative size and measurements, however accurately taken, as most gulls vary a little in size. Bonaparte's Gull has the shaft of the first primary black, or nearly black, except a small portion towards the tip where the white on the inner web runs up to the shaft. This may vary a little, as the skin sent to me by Mr. Saunders seems a very light

one, and has the shafts of the primaries paler than either my American skin or Mr. Pershouse's specimen, but still the shaft is by no means white as in *Larus ridibundus*, and besides this there is on the inner web of the first primary of Bonaparte's Gull a black streak, on the inner web next to the shaft, the outer part of the web being white, the white only running up to the shaft at one part about half an inch from the tip; the tip itself is black. In *Larus ridibundus* this order of things is reversed, the inner web being white next the shaft, with a small streak of black outside the white. This is equally applicable to the second and third quills, and will at once distinguish this bird from *Larus ridibundus*. From the immature Little Gull the primaries may also serve to distinguish it. There is no white on the shaft of the first three primaries of the Little Gull, the shafts being black to the tips, nor does the white on the inner web anywhere extend to the shaft. In the Little Gull also there is no white on the outer web of the fourth and fifth primaries, as there is in *Larus philadelphia*, the white being very visible even in the closed wing: these distinctions, many of which are pointed out in Mr. Howard Saunders's paper on the *Larinæ* in the 'Proceedings of the Zoological Society' (1876, p. 206), and the figures of the first three primaries of *Larus ridibundus* and *Larus philadelphia* there given, and which are apparent in the specimens of all three birds now before me, will, I think, be sufficient to help anyone into whose hands a specimen of Bonaparte's Gull may fail to recognize it at once, and to distinguish it from either of the commoner British Gulls for which it may be mistaken.—Cecil Smith (Bishops Lydeard, Taunton).

Sooty Shearwater at Bridlington.—In December, 1882, an example of this widely-distributed Shearwater, so long confused with the Greater Shearwater, as a visitor to our shores, was presented to the Oxford Museum by the Rev. E. Elton, of Wheatley Vicarage, Oxon, at the suggestion of Professor Westwood. Mr. Elton informs me that this example of *Puffinus griseus* was shot by his nephew, the late Mr. John Elton, in Bridlington Bay in 1872. The fishermen there called it "the black Shearwater." This appellation seems analagous to that of "Black Hagdon," by which, according to Mr. Dresser ('Birds of Europe'), it is known in the Bay of Fundy. [It is also called Hagdown in the South of Ireland, *see* Thompson vol. iii., p. 408.] So far as records in 'The Zoologist' go, this Shearwater, now at Oxford, is the last obtained on the British coast; at least I have failed to find any (but the old, Irish) reference to the species, since three were obtained in September, 1866, also at Bridlington, as recorded by Mr. W. Boulton (Zool., 1867, p. 543); at the time these birds were supposed to be immature Great Shearwaters. Messrs. Clarke and Roebuck include *Puffinus griseus* in their list of the Vertebrates of Yorkshire (p. 85) as a "casual visitant, of rare occurrence in the winter." But the first British example, apparently, on record, was obtained by Mr. G. Marwood, jun., at

Teesmouth, in August, 1828, so that it would appear to be as much an autumn as a winter visitor.—Hugh A. Macpherson (3, St. James Road, Carlisle).

Honey Buzzard caught at Sea.—On the 25th November last I received from Great Yarmouth a live Honey Buzzard, which had been caught two days previously on board a ship at sea, upon which it had settled, tired out probably on its migration to our shores. It appeared to be in good health, and showed no sign of fear or wildness in its captivity. I gave it meat, liver, "lights," and the heads of chicken and pheasant, which for the first week or ten days it ate freely, so that I hoped to be able to keep it alive. Its appetite, however, seemed to fall off, and, though tempted with rats, mice, birds, and a worm, it refused to eat, and on the morning of December 19th I found it dead. Mr. W. Lowne, of Great Yarmouth, to whom I sent it for preservation, found the liver affected, part of it being as black as ink. The plumage was a uniform dark rich brown, the legs, toes, and base of the beak a bright yellow, the iris a greyish hazel. The bird frequently raised the narrow-pointed feathers at the back of the head, which formed a crest, a peculiarity I do not find mentioned by Yarrell. When approached it often made a noise in its throat somewhat resembling that made by a hen.—Hugh Turner (Ipswich).

Birds of the Banbury District.—Under this title the Banbury Natural History Society has recently published in pamphlet form (pp. 28) a list, by Messrs. Aplin, of the birds which have been procured or observed within a radius of six miles of the head-quarters of the Society. The district consists for the most part of land in a high state of cultivation, small fields with thick hedgerows, fairly well timbered; but, although it lacks the wild character of some more favoured localities, it embraces such features as Tadmarton and Wigginton Heaths, the valley of the Cherwell, with its numerous tributaries so attractive to aquatic species, and Clattercutt Reservoir, where the Great Crested Grebe breeds. The list comprises 180 species, of which the most noteworthy have been already at various times reported on by Messrs. Aplin in the pages of 'The Zoologist.'

Hobby in the Co. Tipperary.—As the Hobby is a rare bird in Ireland (see 'Zoologist,' 1877, p. 471), it may be worth while to communicate the following note which I received from Mr. W. Corbet, of Green Hall, Rathcormack, whose passion for falconry and for keeping various birds and animals in confinement is well known in this country. He writes:—"I shot a wild Hobby and saw another some years ago. I have had trained ones which I got from Castang, of Leadenhall Market, London, and could not be mistaken as to the species. I have been practising falconry for fifty years, and have had all the hawks used in falconry—the Greenland, Iceland, Saker, Lanner, Peregrine, Hobby, Merlin, Goshawk, and Sparrow

Hawk—and I ought, therefore, to "know a hawk from a heronshaw." The Hobby is larger than the Merlin; the points of his wings reach to the tip of his tail, and he flies higher." In reply to my request for further particulars of the one shot by him in Ireland, I have received a fuller communication from him, dated the 11th December last, in which he states:—"It is now about twelve years ago since I shot the Hobby in the Co. Tipperary, near Bird Hill. It was a male bird in mature plumage. I skinned it, but a cat got at the skin and spoiled it. I think it was towards the end of September I shot it." Six instances of the occurrence of the Hobby in Ireland have been noticed by the Editor in 'The Zoologist' for 1877, p. 471. The above instance mentioned by Mr. Corbet makes a seventh.—R. J. Ussher (Cappagh, Co. Waterford).

The Note of the Manx Shearwater.—In justice to Mr. H. Chichester Hart, whose communication on this subject appeared in the last number (p. 81), it may be stated that after it had been printed, and before it was published, he wrote to correct his impression that the Manx Shearwater was "a silent bird, in consequence of his finding no allusion to its note in the books." A correction to that effect, however, had already been supplied in the editorial note to a much fuller extent, and it was too late to make further alteration.—Ed.

Interbreeding of Blackbird and Thrush.—I have for several years been occupied in collecting all the recorded cases of apparent interbreeding between Blackbirds and Thrushes. I have now got notes of between twenty and thirty such instances, which I am putting together for the purpose of examination, and I shall feel obliged to any ornithologists who will direct my attention to any obscure instances which are likely to have escaped my notice.—Robt. Miller Christy (Saffron Walden).

Hobby breeding in South Lincolnshire.—Mr. Seebohm, in his new work on 'British Birds,' mentions this falcon as breeding annually in North and Mid Lincolnshire, on the authority of Mr. John Cordeaux, thus leaving out the southern part of that county. Several times to my own knowledge it has bred there, and last year a pair took possession of a deserted Crow's nest in a wood, but before any eggs were laid one of the birds was shot. However, another mate was found in a day or two, and before again being molested three eggs had been laid, when the female bird unfortunately fell to the keeper's gun.—J. Cullingford (University Museum, Durham).

Singular Accident to a Robin.—I was driving one day on the road, when I caught sight of a Robin by the edge of the grass struggling a little and presenting an unusually odd appearance. On getting down in order to look at it, I found the mouth wide open, and no sign of the lower mandible, which, on closer examination, I found to be completely imbedded

beneath the skin of the neck and along the sternum. With great care I managed to disengage the bill, and although the bird seemed nearly dead from strangulation, I laid it down in a safe place, hoping it might recover by the time I came back. I returned to the spot in a couple of hours, when I found the bird had disappeared, probably not much the worse for its singular misadventure. No doubt it had been busy preening itself when its sharp beak happened to transfix the skin, and of course during its efforts to withdraw it the beak only penetrated further and further under the skin.—Frederick Long (Wells next the Sea, Norfolk).

Varieties of the Wheatear and Siskin.—From the description given (Zool. 1882, p. 352) of the variety of the Wheatear shot in Kirkcudbrightshire, I would suggest that it may be merely a young bird in a certain state of plumage, for it corresponds almost exactly with one which I shot some time ago, and which was, I think, certainly a young bird changing its first feathers for the winter plumage. My father has a variety of the male Siskin which curiously resembles that recorded at p. 368, as having "a white instead of a black cap to its head," his bird having the cap almost entirely yellow.—J. H. Gurney, Jun. (Northrepps, Norwich).

Building Sites of House Martin.—As Mr. Young has noted (p. 34) instances of the House Martin building in cliffs, I may mention the two communities of this species which I can remember for over thirty years nesting among the sandstone cliffs of Ardmore, on the coast of this county. In both cases the nests are clustered beneath lofty arches of rock overhanging the sea, positions evidently chosen as being inaccessible except on wings. One of these breeding places is at a considerable distance from the other. No Martins build under the eaves of houses in that neighbourhood. Ardmore is one of the many localities mentioned by Thompson (pp. 390-1) where Martins breed in precipices on the Irish coast.—R. J. Ussher (Cappagh, Co. Waterford).

Wildfowl at Poole.—I have received a female specimen of the Great Northern Diver, in mature winter plumage, weighing 8½ pounds. Its stomach contained the remains of some small fishes. I have also received three Shoveller Ducks, an adult male and female and an immature male; and two female Red-breasted Mergansers. All these birds were shot by a punter on the 18th November in Poole Harbour.—C. A. Marriott (Lewisham, Kent).

Late Breeding of Swallows and Martins in Kirkcudbrightshire.—I noticed two Swallows flying about Edenbank, the residence of Provost Lennox, near Maxwelltown, for more than a fortnight after the others had gone south. At my request Mr. James Lennox made an examination on October 18th of the nests under the porch, where these two pairs had

already brought out at least one brood of young each. Mr. Lennox found that in one nest there were eggs just on the point of hatching, and the other nest looked as if it had been only a few hours vacated by a young brood. The old Swallows were not seen after the evening of the 17th October. On the 19th and 20th October a Swift was seen flying along the streets and over the houses of Maxwelltown. On the 20th October I saw beneath the eaves at Lochanhead Railway Station, about five miles west of Maxwelltown, a brood of four Martins that would probably be ready to leave the nest on the following day. The parents were busily catching for them the "midges" that swarmed along the roadsides during the sunny blinks betwixt the very heavy showers that had continued during the whole day. The dates for each of these three species are later than I have ever previously noted, and it is to me the more remarkable since the great body of the Swallow tribe left us last season a few days earlier than usual. The many cold, wet, and blustering days last autumn may account for this earlier departure, but there were frequent warm, though dull, days, on which Dipterous and other small insects were abundant in the air, and these may have enabled the individuals I saw to prolong their stay, which was plainly attributable to causes that affected individuals only.—ROBERT SERVICE (Maxwelltown, Kirkcudbrightshire).

Great Grey Shrike in Suffolk.—I had a fine adult specimen of this bird brought to me by Mr. J. A. Smith, of Akenham Rise Hill, near Ipswich. It was shot on December 2nd, and is believed to be the only specimen killed here for many years past.—J. E. TAYLOR (The Museum, Ipswich).

Great Grey Shrike near Cockermouth.—I had the good fortune to have given me a Great Grey Shrike, shot by Frazer, head-keeper to Mr. L. F. B. Dykes, of Dovenby Hall, on the 11th December last. Though very badly shot, I succeeded in skinning it, and have got a fair specimen. It is a bird rarely shot in this neighbourhood.—GEORGE MAWSON (Cockermouth).

Curious Site for Sparrow's Nests.—At Hove, on the western side of Brighton, are some large gas-holders. Round the circumference of these huge cylinders small wheels are attached, with broad flat spokes, which pass up and down against the upright supports of the holders, so that when the holders are filled, they rise to a considerable height, and when they are nearly exhausted of gas they fall almost to the trough of water surrounding the base of the cylinders. The Sparrows in the neighbourhood often build their nests between the nave and rim of these wheels, supported by the broad spokes, and have sometimes even hatched their young, notwithstanding the fact that the nest and its contents must slowly revolve, so that at each half-revolution what was the top of the nest becomes the bottom, and the sitting bird must have accommodated itself to the altered position

by gradually shifting the eggs. I am informed by the engineer of the works that, as the nests cause obstructions in the wheels, they are usually removed before the young are fledged.—J. Jenner Weir (6, Haddo Villas, Blackheath).

Ornithological Notes from the Isle of Wight.—On October 3rd, 1882, a Thick-knee Plover was picked up on Bembridge Down. A Red-necked Phalarope, 7⅛ inches in length, was received by Mr. Smith, the taxidermist at Newport, on October 29th, the first he had seen or heard of in the island, after twenty-one years' experience there. The Grey Phalarope has been a frequent autumnal visitor to our shores of late years. In the northern part of the kingdom the Red-necked species appears to be more frequently met with than the Grey, which had only once come under Macgillivray's observation in winter, whereas the former is said to be "much more numerous." There is no accounting for the great increase of the number of Phalaropes visiting us in the autumn; either the species must be much more numerous or the migratory line of flight changed.—H. W. Hadfield (High Cliff, Ventnor).

Wren building in deserted Nest of Martin.—A pair of Wrens built last year (1882) in the deserted nest of a Martin, *Hirundo urbica*. The latter was sixteen feet two inches from the ground, with an eastern aspect.—H. J. J. Brydges (Boullibrooke, Presteign).

[A curious and unusual situation.—Ed.]

Occurrence of the American Kestrel in Yorkshire.—A female example of *Falco sparverius* was shot by a gamekeeper near Helmsley, Yorkshire, in May, 1882. I first saw the bird with Mr. C. Helstrip, bird-stuffer, St. Saviour's Place, York, on the 14th November last, and have since bought it, being perfectly convinced as to its authenticity. I have seen for myself both where the shooter stood and where the bird fell. I am informed by my friend Mr. Robert Taylor, of Harome, near Helmsley, who skinned my specimen, that a pair were killed, but that only one was found, They were shot in a small copse of deciduous trees, and the nature of the undergrowth was such that "marking them down" was made completely out of the question, falling as they did in different directions. I have shown the bird to Mr. Seebohm, and he confirms my opinion as to the species. It agrees very well with a specimen in his collection. The total length is only 9¾ inches. The red marks upon the head, which are characteristic of the bird, are well defined, and also the dark regular bars extending across both wings and back, and on the tail. On November 30th I went again to Harome, and was told that the skeleton of the second bird had been found The specimen is, I believe, the only one on record as having been taken in Europe. It has no appearance whatever of ever having been in confinement. the feathers being remarkably perfect.—J. Backhouse, Jun. (York).

The Mealy Redpoll in Norway.—As the Rev. H. H. Slater mentions (p. 11) that he only once satisfactorily identified the Mealy Redpoll, it is perhaps noteworthy that late in July, 1878, this species was very plentiful at Hjerkinn and other stations on the Dovre. The young birds were very familiar: I frequently observed them perching upon palings close to and sometimes on the roof of the stations. They appeared to be feeding on grass-seeds.—H. A. Macpherson (Carlisle).

Nocturnal Movements of the Coot.—While staying at Stackpole Court, Pembrokeshire, on the 23rd January last (a bright moonlight night, with a light wind from S.E., time 12.45 a.m.), I observed from my window, about ninety feet from the water below, a large black object, about twenty feet long and six feet broad, moving through the water at the rate of about two or three miles an hour in various directions; there was a good deal of splashing about the tail and sides of the object. I called Lord Kensington's attention to it; it had the appearance of some large fish,—a shark or something of that sort,—and, as we could not make out what it was, we went down to the water's edge to investigate, and found it was a mass of Bald Coots, which dispersed on seeing and hearing us. Looking down from the window above there was no interval perceptible between the birds, who were in one solid black mass. After returning to the house we watched them for half an hour from the window; they all crowded together again, and continued their gyrations about the water in different directions, both up and down wind.—H. W. Campbell (44, Charles Street, Berkeley Square).

Late Stay of Swift in South Wales.—Swifts should be gone before October, but I saw one here repeatedly in that month and even later, always in the same place, close to the Cathedral. The following are the dates of which I made notes of having seen it:—Oct. 25th and 26th; the 30th, a cold and cloudy day; again on Nov. 2nd (stormy, with heavy showers); and lastly, Nov. 10th (bright and clear, but cold). I was unable to look for it between Nov. 2nd and 10th.—H. Rogers (Llandaff).

Hybrid between Greenfinch and Linnet.—A year or two ago I placed in the western aviary of the Zoological Gardens a female example of this hybrid, which, for aught I know to the contrary, may still be living there. Another was netted near Reading a few years since, and passed into the possession of my correspondent, Mr. S. Salter, jun., who recently informed me that it exhibited the rosy or carmine breast of the male Linnet in breeding plumage.—H. A. Macpherson (Carlisle).

Great Snipe in Nottinghamshire.—A Solitary Snipe was shot on October 3rd at Hickling in this county; it was in good plumage and weighed eight ounces and a half. This is only its second occurrence in Nottinghamshire.—J. Whitaker (Rainworth).

Migration of the Jay.—Referring to the notes which have already appeared on this subject (pp. 1, 27, 76, 77), I may remark that the Jay has certainly been more plentiful than usual with us during the past autumn and winter. I have several times seen upwards of a dozen together; this is in a part of the district where they hardly ever breed, but where a few may generally be noticed from October to March.—Oliver V. Aplin.

Assumption of Male Plumage by a Female Wild Duck.—A Wild Duck, which was hatched and brought up in a domesticated state in the parish of Northrepps in the year 1854, lived till February, 1883, when it died, after having been for some months quite blind. For the last eight years of its life, or thereabouts, this Duck has exhibited a complete drake's plumage, with the exception of a sprinkling of brown intermixed with the green male plumage on the sides of the head and neck, and also with the exception of a very few brown feathers of the female type scattered on the flanks.—J. H. Gurney (Northrepps Hall, Norwich).

Moorhen in a Rabbit's Earth.—Whilst ferreting on Feb. 3rd a Moorhen (*Gallinula chloropus*) came out of a rabbit's hole. Not having heard of a similar circumstance, I inform you of the fact.—Darell Stephens (Mapperton, Beaminster, Dorset).

[Doubtless the bird was suddenly surprised, and no other place of concealment was at hand. We have more than once seen a Moorhen attempt to creep into the hole of a Water Rat, which proved too small for it, and have also seen a winged Red-legged Partridge take refuge in a Rabbit's burrow.—Ed.]

Uncommon Birds near York.—The following uncommon birds have recently been obtained in the neighbourhood of York, and are now in the hands of Mr. E. Allen, of Feasegate, in this city, for preservation, where I have had the opportunity of seeing them. A Waxwing, shot at Acaster; a Peregrine Falcon, killed near Escrick; a Grey Plover, obtained near Cottingwith; a Greenshank (*Totanus glottis*), shot at Sheriff Hutton; a Turnstone, killed on Eldwick Moor out of a flock of seven; a White-fronted Goose, obtained at Cottingwith; a Great Grey Shrike, shot at Kiplingcotes; a Little Auk, from near Harrogate; an American Bittern (*Botaurus lentiginosus*), shot at Welbury; and a Common Bittern (*Botaurus stellaris*), killed near Hull. Besides these I saw a curious rufous variety of *Phasianus colchicus*, and a pied variety of the Blackbird.—C. D. Wolstenholme (York).

Grey Phalarope in North Oxon.—On the 22nd December last I examined an adult specimen of the Grey Phalarope (*Phalaropus fulicarius*), which a boatman had that morning picked up by the canal-side about a mile north of this town.—Oliver V. Aplin (Banbury, Oxon).

Waxwing in South Lincolnshire.—On the 13th Dec. a nice specimen of this bird was shot on the coast of Lincolnshire, and sent to me. There are six wax-tips on each wing. The bird was in good condition, and had been feeding upon the berries of the mountain-ash.—J. CULLINGFORD (University Museum, Durham).

Eider Duck in Nottinghamshire.—A female Eider Duck was shot on November 16th in the meadows near Nottingham, where it was no doubt attracted by the large floods, many acres there being under water. This is the first time it has been obtained in this county, and makes the Nottinghamshire list to number 240 species, which, considering it is an inland county, is a large number.—J. WHITAKER (Rainworth).

Missel Thrush and Chaffinch nesting in proximity.—A Chaffinch built in an apple tree in my garden last May on one side of a walk, on the other side of which was a Missel Thrush's nest in another apple tree. This corroborates the observations of Mr. Christy mentioned at pp. 31 and 32.—R. J. USSHER (Cappagh, Co. Waterford).

REPTILES.

Smooth Snake in Surrey.—Mr. Axford, in 'The Zoologist' for February, in commenting on my discovery of *Coronella lævis* at Chobham Ridges (not "Bridges," as erroneously printed), suggests that it was either injured, or a tame one. I am quite sure it was uninjured, and think in such a locality it is most improbable that it was a tame one. I am more inclined to think that the chilliness of the evening—it was just about sunset—may have made it sleepy.—HENRY N. RIDLEY (Natural History Museum, South Kensington).

BATRACHIANS.

Habits of the Edible Frog.—Apropos of Mr. Rope's accurate account of the habits of this species (p. 49), I quote a brief extract from my journal, under date Sept. 15th, 1881:—"Found to-day, in about three inches of stagnant water, some fine tadpoles of *R. esculenta*, nearly as large as fully-developed frogs; they had for the most part only the posterior legs protruded. They are very expert in avoiding capture, darting away for a little distance, and then assuming a position of apparent repose. When thus at rest the colour of these tadpoles serves admirably for protective purposes, it being by no means easy to detect the ugly little monsters upon a muddy brown surface. After leaving the water, the young *R. esculenta* wanders to a considerable distance from that element; should it be alarmed, however, in the immediate neighbourhood of water, it generally makes for the water like its elders." I may mention that the colour of these little frogs is of a colour approxi-

mating closely to that of a dry field; whilst the usual green dress of the adults, though varying from a very light shade to a very dark one, serves also, as Mr. Rope suggests, to protect the patriarchs of the pool amid the herbage they love. But a favourite "mizpeh" is a defunct cat or dog, when the harmony of colour is less obvious. I have found the colour of *Bombinator igneus* approximate closely to that of the muddy ditches in which it revels. As to Mr. Rope not having found the Edible Frog in running brooks, it was certainly plentiful in the stream (or canal) which passed through the Villeneuve Marshes, where I made the above jottings I found the best way of catching mature examples was to walk down the stream, "marking" each Frog as he sprang into the water. Invariably the Frog swam out towards the middle, but always turned back without crossing, and hid its head in the mud of the near bank. When the Frog had thus hidden its head like the ostrich of history, it was easy to capture it with a quick "grab" of the hand. In this way I caught a baker's dozen very quickly, after having spent a whole day in trying to take them with a net.—Hugh A. Macpherson (Carlisle).

The Natterjack Toad at Carlisle.—I am much interested by Mr. Rope's account of the colony of Natterjacks at Coldfair Green. My friend Mr. H. Holton, jun., tells me that he obtained a fine adult of *Bufo calamitosa* at King Moor, near Carlisle, in August, 1882. It would be well to ascertain whether the partiality to the sea (which, as Mr. Rope reminds us, is well exampled by Bell's long-established locality on the shores of Solway) can be attributed to the distribution of any favourite food of the Natterjack. I shall try to renew my acquaintance with this species on the Solway this spring.—H. A. Macpherson.

FISHES.

The Salmon Disease.—In certain rivers the Salmon are affected by an epidemic disease, which manifests itself in white patches upon the fish where there are no scales. As the fungus grows a sore forms, which may extend to the bone. According to Professor Huxley, the fungus is a *Saprolegnea*, probably *S. ferax*, but of this there is no proof. The zoöspores from this fungus were never observed ciliated and motile; but they are exceedingly minute, and become rapidly disseminated. They are produced in great numbers—a single fly infected with the fungus may bear 1000 fruiting hyphæ, which in one day may produce 40,000 zoöspores. The hyphæ seem not only to traverse the epidermis of the fish, but also to bore through the superficial layers of the derma. The epidermis is entirely destroyed. The only method of preventing the spread of this fungus among Salmon is to remove every infected fish from the stream, though it may not be worth while to adopt this method in practice. Although sea-water kills the fungus when it comes in contact with it, if the latter has

penetrated the derma the fish may go to the sea and recover from its attack, but on returning to fresh water the disease may break out again from the hyphæ in the derma.

ARCHÆOLOGY.

Fishing with Trained Cormorants, temp. Charles I.—Pennant, in his account of the Cormorant ('British Zoology,' 1812, vol. ii., p. 283), says: "These birds have been trained to fish like falcons to fowl. Whitelock tells us that he had a cast of them manned like Hawks, and which would come to hand. He took much pleasure in them, and relates that the best he had was one presented to him by Mr. Wood, Master of the Cormorants to Charles I." It is presumed that the "Whitelock" here referred to was Sir Bulstrode Whitelocke, the author of "Memorials of English Affairs from the beginning of the reign of King Charles the First to the happy restoration of King Charles the Second," but I have been unable to find in this work any such statement as that quoted by Pennant, either in the original edition, which has no index, or in the modern edition, in four volumes, published at Oxford in 1853, wherein the index on this point affords no assistance. There was a curious little volume published in 1654 (12mo., pp. 568), entitled "Zootomia; or, observations on the present manners of the English," by Richard Whitlock; and it occurred to me that possibly this might be the author cited by Pennant. But having with some trouble procured a sight of the book, I found it to contain nothing but satirical discourses on morals and manners, in which few readers at the present day would take the slightest interest. Being still curious to trace Pennant's quotation to its original source, in the hope of finding further information on the subject to which it relates, I should be much obliged to any one who, having found it, would furnish me with the exact reference.—J. E. Harting.

A Whale in the Thames in 1658.—The following notice appeared in the 'Mercurius Politicus,' June 3rd to June 10th, 1658:—"Whitehall, June 2nd. This evening came hither divers seamen and watermen to give an account of their having taken a Whale in the Thames not far from Greenwich. It is strange that this kind of monster should quit the sea to come up a river, and advance beyond the salt water so far into the fresh. He hath lain upon the shore these three days at Greenwich Town's end, a spectacle to many thousands of people that have flocked thither to behold him. He is none of the bigger sort, being supposed but young, yet about sixty feet long, and carrieth a very great bulk in the other dimensions."

[This was probably a Rorqual or Fin Whale.—Ed.]

Sperm Whales on the Kentish Coast in 1762.—An old newspaper of May 17th, 1762, states that "the spermaceti and blubber of the four

Whales which were ashore at Burchington and Broadstairs were sold last Wednesday for £374 18s., and that at Deal for £149, which was much more than was expected."

Former Occurrence of the Great Bustard in Yorkshire.—'The Sporting Magazine' for October, 1792, states that "within these few days a Bustard was killed at Rudstone-on-the-Wolds by a gamekeeper belonging to Sir Griffith Boynton. The width of the wings was seven feet over."

SCIENTIFIC SOCIETIES.

Linnean Society of London.

January 18, 1883.—Sir John Lubbock, Bart., F.R.S., President, in the chair.

The following gentlemen were balloted for and severally elected Fellows of the Society:—Edward A. L. Batters, A. J. Burrows, Edgar F. Cooper. Prof. J. A. Harker, and George Lewis.

There was exhibited, on behalf of Mr. James Romanés, a live specimen of *Pieris rapæ*, which had been found fluttering on the window of his house a few days previously. Mr. Stainton remarked that this early appearance of the insect in question might be accounted for by the fact that the eggs were often hatched on the flowers of *Tropæolum* within doors, and hence the imago would issue sooner than in out-door specimens.

Mr. A. G. Bourne offered some remarks on the anatomy of *Polynoina*, pointing out that *Polynöe Grubiana* (very common in the Mediterranean) is only a variety of *P. clava*, Montague, of our own coasts, which has certain constant characteristics and others more variable.

Prof. P. M. Duncan read his "Observations on the Madrepore Corals, Fam. Fungidæ, with special reference to the hard structures." The family Fungidæ of Dana was further elaborated by MM. Milne Edwards and Jules Haime in their 'Hist. Nat. des Coralliaires.' They described the synapticula as constituting an essential family structure, and also the absence of endothecal dissepiments. In Dr. Duncan's communication he describes the ridge of the continuous synapticula with canals between them limited by solid and also perforate septa, and delineates the structures; the synapticula are shown to have no relation to the ornamentation on the ridges of the septa. The basal wall is stated to be of synapticular origin, and the foramina in it to relate to the growth of these binding structures. The anatomy of species of *Fungia*, *Herpolitha*, and *Holomitra*, Dana, is given, and it is shown that it is the last genus what the author considers to include *Pedolacia*, Eclatt; the synapticula begin to be divided and dis-

continuous, leading to the condition seen in the Anabaciaceæ and Lophoserinæ. The microscopic value of the septa and synapticula is considered, and these last structures are shown to be produced in some instances before the thin septum, which very well unites to the larger one; while the synapticular structures are not always continuous with those of the larger septa. The direction of the ultimate histological elements of the two structures differs, and there is connective tissue between them.

February 1, 1883.—Sir JOHN LUBBOCK, Bart., F.R.S., President, in the chair.

Messrs. F. W. Burbridge and Joseph Johnson were balloted for and elected Fellows of the Society.

Dr. W. C. Ondaatje called attention to a Red Coral from Ceylon.

A paper was read by F. Maule Campbell "On the pairing of a Spider, *Tegenaria guyonii*, and description of certain sexual organs in the male." Some of the habits of spiders, and especially of this species, were mentioned as bearing on the conflicts of the sexes which were described, and the specific benefits which would arise from them referred to. The paper concluded by a note on certain glands (probably of spinning function) situated on the convexity of the abdominal sexual region. The ducts, considerably convoluted, open through transparent tubular spines, arranged transversely to the axis of the body of the spider. Two papilla-like processes below the opening of the genital sinus were described.—J. MURIE.

ZOOLOGICAL SOCIETY OF LONDON.

February 6, 1883.—Prof. W. H. FLOWER, LL.D., F.R.S., President, in the chair.

The Secretary made a report on the additions that had been made to the Society's Menagerie during the month of January, and called attention to examples of two species of Passerine Birds from Japan (*Turdus cardis* and *Parus varius*) new to the collection.

A letter was read from Mr. F. C. Selous, dated from the Matabele Country, on the possibility of obtaining a White Rhinoceros.

Extracts were read from a letter received from the Rev. G. H. R. Fisk, of Cape Town, giving an account of the habits of some Reptiles which he had had in captivity.

A communication was read from Messrs. Salvin and Godman, containing the description of a new species of Pigeon of the genus *Otidiphaps* from Ferguson Island, one of the D'Entrecasteaux group, which they proposed to call *O. insularis*.

Mr. Sclater read some further notes on *Tragelaphus gratus*, and exhibited drawings of both sexes of this Antelope, taken from specimens living in the Menagerie of the Jardin des Plantes, Paris.

A communication was read from Mr. E. W. White, containing some supplementary notes to a former paper on the birds of the Argentine Republic.

A communication was read from the Rev. G. A. Shaw, containing some notes on the habits of an Aye-Aye which he had had in confinement for several months, and other information respecting this animal.

Mr. G. A. Boulenger read a paper containing the description of a new species of Lizard of the genus *Enyalius* from Peru, which he proposed to name *E. palpebralis*.—P. L. Sclater, *Secretary*.

NOTICES OF NEW BOOKS.

Cassell's Natural History. Edited by Professor Martin Duncan, F.R.S. In six volumes, 4to, with numerous illustrations. London: Cassell, Petter, Galpin & Co. 1878–1883.

We have been too long accustomed to find in zoological text-books a long string of quotations from various authors of an older generation, ill-assorted, uncondensed, and unverified, and containing not unfrequently a variety of statements which may have been perfectly true in a sense at the time they were written, but which very inaccurately represent the views of modern scientists. It is time that such text-books as these were superseded, and we are glad to see the attempt which has been made by Prof. Duncan in the volumes before us to furnish students of Zoology with something more accurate, more comprehensive, and more philosophical than they have yet been able to obtain in the way of a text-book.

Although the attempt has frequently been made, no individual author has succeeded in producing unaided a satisfactory general work on Natural History, it being virtually impossible for any one man to be thoroughly conversant with every branch of so large a subject. The merit of the present publication lies in the fact that, under the guidance of a competent editor, the work has been divided among specialists, each of whom has made a particular study of the class of Vertebrates, or Invertebrates, as the case may be, on which he has undertaken to write. The reader, therefore, may reasonably infer that the information afforded him in each department of the work is, if not thoroughly

exhaustive, at least thoroughly reliable, so far as it goes; and this is what is wanted at the present day.

We will not pretend to say, as regards the Vertebrata, that the various classes have been so well treated of as not to stand in need here and there of improvement, for we have noted several cases in which fuller information would be desirable, and some rearrangement necessary to ensure greater accuracy and simplicity.

In the case of the Invertebrata, for want of a sufficient knowledge of many of the groups, we hesitate to express an opinion; but the names of the writers, as it seems to us, furnish a sufficient guarantee of the accuracy of their work.

The contents of the volumes may be thus briefly stated:—

Vol. I.—Apes and Monkeys, by Dr. Duncan; Lemurs, by Dr. Murie; Bats and Insectivorous Mammals, by Mr. Dallas.

Vol. II.—Land Carnivora, by Prof. Parker; Aquatic Carnivora, Cetacea, and Sirenia, by Dr. Murie; Elephants and Conies, by Prof. Boyd Dawkins and Mr. Oakley; Ungulata, or Hoofed Animals, by the two last-named and Prof. Garrod.

Vol. III.—Ruminants, by Prof. Garrod; Rodents, by Mr. Dallas; Edentata (Sloths, Anteaters, and Armadilloes) and Marsupials, by Dr. Duncan; Birds (the Accipitres and Picariæ), by Mr. Sharpe.

Vol. IV.—Birds (the remaining Orders), by Mr. Sharpe; Reptiles and Amphibians, by Dr. Duncan.

Vol. V.—Fishes, by Prof. Seeley; Mollusca and Tunicata, by Dr. Woodward; Molluscoidea, by Miss Crane; Coleoptera, by Mr. Bates; Hymenoptera, by Mr. Dallas.

Vol. VI.—The remaining Orders of Insects, by Mr. Dallas; Myriopoda and Arachnida, by Mr. Dallas; Crustacea, by Dr Woodward; Vermes, Zoophyta, and Infusoria, by Dr. Duncan; Echinodermata, by Mr. P. H. Carpenter; Spongiæ, by Prof. Sollas; Rhizopoda, by Prof. Rupert Jones.

It would be, of course, impossible in the limited space at our disposal to give anything like an adequate review of each volume, the contents of which are here indicated; but it will be seen from the above array of names that the Editor of the work has spared no pains to make it as complete and accurate as possible by securing the co-operation of those who are well qualified to write on the subjects allotted to them.

This, as we have said, is a characteristic feature in the present work. Another feature is the way in which the Editor deals with the subject of classification. Nine authors out of ten

in taking up any branch of Zoology or Botany, almost invariably commence by giving their ideas of classification, and having laid down a scheme to their satisfaction, proceed to deal *seriatim* with the species under review, in the order which this classification indicates. There can be no doubt that this method affords an aid to memory—the key to the classification furnishing, as it were, a route map to the unknown country which has to be explored. Dr. Duncan, however, takes a different view. He says, in effect, "If you want to puzzle a beginner, set before him a scheme of classification (bristling with scientific names) which

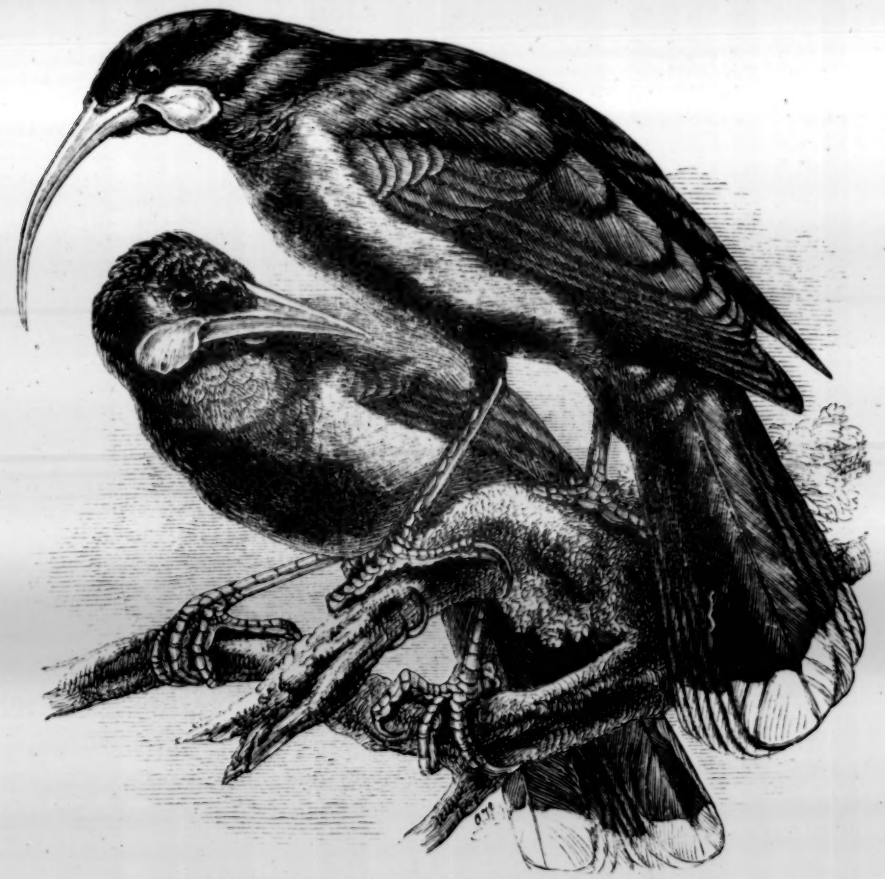
THE KOALA, OR NATIVE BEAR OF AUSTRALIA,
Phascolarctus cinereus.

he cannot understand, for he has learnt nothing of the relationships of the various orders, families, and genera, and which he cannot remember for the same reason." His advice to a student, in a word, is "Get hold of your facts first, and learn to group them afterwards."

This doctrine is carried out in the present work, and so pleasantly is the lesson imparted that the reader experiences no feeling of being bored by technicalities, and at the same time acquires, as he proceeds, a considerable amount of information.

Each volume is illustrated, but, we think, somewhat too profusely; for the illustrations are not all of equal merit, and many of them are certainly not good enough to be retained either as works of art, or as accurate delineations of the objects they are intended to represent. In a future edition a judicious weeding out of the less satisfactory ones would make room for desirable additions to the text, and thereby enhance the value of the work.

Through the kindness of the publishers we are enabled



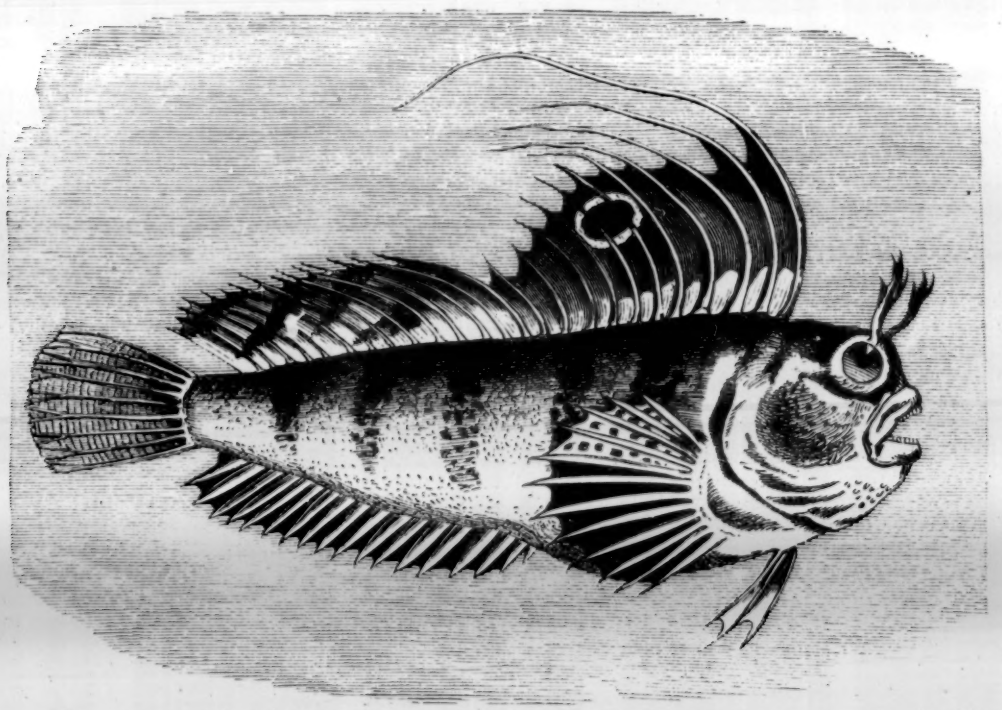
THE NEW ZEALAND HUIA, *Heteralocha acutirostris*.

to reproduce here the illustrations which are given of a few remarkable species, namely:—

1. The Koala, or Native Bear of Australia, *Phascolarctus cinereus*, a specimen of which lived for some time in the Regent's Park Zoological Gardens, feeding on the leaves of the blue gum-tree, especially procured for it. It is one of the *Phalangistidæ*, a family of the Marsupials, or pouched animals, arboreal in its

habits, and descending at night from the trees to prowl about in search of succulent roots, which it scratches up; but it derives its chief sustenance from the leaves and tender shoots of the blue gum, of which it appears to be very fond.

2. The New Zealand Huia, or Wood Crow, *Heteralocha acutirostris*, is chiefly remarkable for the difference which is observable in the bills of the sexes, a peculiarity which, according to the observations of ornithologists in New Zealand, is not without its use. They frequent decayed trees which are infested with the



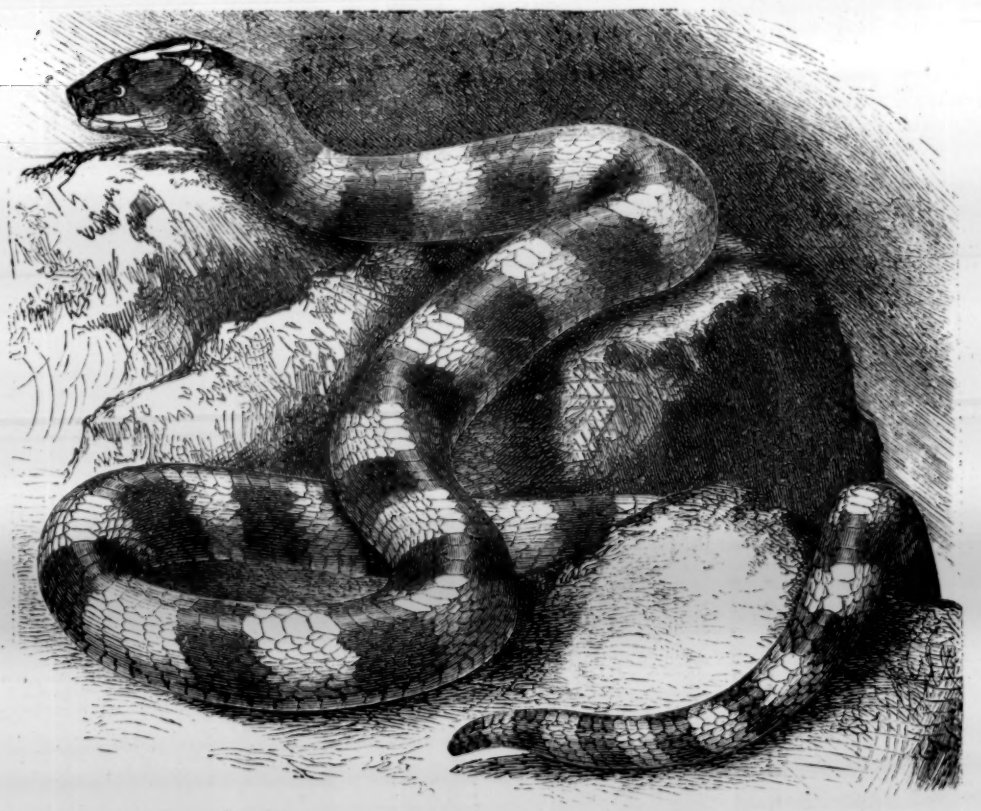
The Butterfly Blenny, *Blennius ocellaris*.

hu-hu grub (the larva of a large nocturnal beetle, *Prionoplus reticularis*), and the different development of the mandibles in the two sexes enables them to perform separate offices. The male, with his shorter and more conical bill, attacks the decayed portions of the wood, chiselling out his prey after the manner of some Woodpeckers, while the female, with her long pliant bill, probes the other cells, where the hardness of the surrounding parts resists the chisel of her mate.

3. The Butterfly Blenny, or Sea Butterfly, *Blennius ocellaris*, remarkable for its peculiar and bright colours, is not uncommon

in the Mediterranean, and was first noticed as a British species by Montagu, who obtained specimens from an oyster-bed at Torcross on the Devonshire coast. He observed that those in which the ocellated spot was most perfect had the first dorsal ray very long. Since his day it has been met with more frequently on our coasts. Mr. Cornish reports that it is not uncommon near Falmouth, but elsewhere on the Cornish coast rare.

4. The Bungarum Pamah, *Bungarus fasciatus*, is a very venomous snake between three and four feet in length, which is



The Indian Bungarum. *Bungarus fasciatus*.

found nearly all over India. It may be recognised at once by its peculiar markings being ringed alternately with steel-blue and bright yellow; by its triangular outline having a dorsal keel of hexagonal scales; and by the hard blunt end to the tail. It does not erect its head, but lies coiled up in curves, and when disturbed jerks itself out like a spring, but without extending its whole length of body. It is not so common as the Cobra, *Naja tripudians*, which sometimes reaches five feet or more in length,

and rarer than the Krait, or Gedi Paragoodoo, *Bungarus cæruleus* (see 'Zoologist' for February, p. 74), which have the under parts uniformly white, and the upper parts bluish or brownish black, uniform, or with very narrow white streaks, not quite as broad as a scale, and generally radiating from a white vertebral spot. These three are amongst the most deadly of venomous snakes.*

THE LEAF BUTTERFLY OF INDIA, *Kallima inachis*.

5. The Leaf Butterflies of the genus *Kallima* are amongst the most remarkable of the *Nymphalinæ*, from the curious resemblance of the under surface of the insect to a dead leaf. The Indian species are nearly five inches in expanse of wing; the

* By the way, why does the writer of the section on the Reptilia in this work give the English name of the poisonous *Sepedon hæmachates* as "Ring Hal's Slang" (*sic.*)? *Ring-hals Schlange* is merely the Dutch for Ring-necked Snake, bestowed on it by the Boers in South Africa.

upper surface of a bluish or purplish colour, with a transparent spot in the middle of the fore-wings; the under surface brown, with a dark streak resembling a midrib running from the tip of the fore-wings to the tail of the hind wings. The under surface is irregularly streaked and mottled, and Mr. A. R. Wallace describes the Sumatran *Kallima paralekta* as being invisible when at rest, from its resemblance to the dead leaves among which it always perches. It sits with its wings over its back, and its

The Sacred Beetle, *Scarabæus sacer*.

head and antennæ raised and hidden between them, while the tails of the hind wings rest upon the branch, corresponding exactly in appearance with the stalk of the leaf.

6. The Sacred Beetle, *Scarabæus sacer*, is one of about seventy species of a genus of Old World Beetles which have their metropolis in tropical Africa, and is remarkable as being that most frequently represented on Egyptian monuments.

Snakes; Curiosities and Wonders of Serpent Life. By CATHERINE C. HOPLEY. 8vo, pp. 592. With illustrations. London: Griffith & Farren. 1883.

FOR a long time past there has been a gap—a something wanting—in ophiological literature, taken as a whole; and no one has hitherto grappled with the task of supplying this one thing needful so courageously as Miss Hopley has done in the book before us. Between the standard authorities—huge tomes, which are often little more than statistical museum catalogues—and the absurd stories about snakes which appear from time to time in the columns of popular journals and magazines, a wide hiatus exists; and, though several books have been cast into the chasm, it has never heretofore been bridged-over in the manner accomplished by 'Curiosities and Wonders of Serpent Life.' Although the writer has much original observation upon which to draw, founded upon a patient study of reptiles, both in this country and in America, she does not by any means disregard the experience of others. "*Audi alteram partem*" is obviously her motto where a disputed point is involved; and what point is there connected with snakes which is *not* matter of dispute? The industry herein indicated is most commendable. It would be difficult to mention any author or publication, general or special, having any bearing on the subject, that has not been hunted up for quotation. Turning to the index at the end of the volume, and selecting, for example, the letter B at hap-hazard, we find the following names among the references under that head:—Lord Bacon, Baird, Owen Baker, Sir Samuel Baker, Balfour, Bancroft, Sir Joseph Banks, the Bard of Avon, Bartlett, Barton, Bartram, Bates, Beal, Duke of Beaufort, Beaumont, Beauvoir, Bell, Ben Jonson, Berkeley, Beverley, Bibron, Bingley, Blake, Bond, Bonnat, Buffon, Bowerbank, Braden, Brittain, Broderip, Browne, Brunton, Buckland, and Bullen; without including such as would come within British India, British Museum, Bridgewater Treatise, Brazil, Bulletins, &c.

Not content with simply describing snakes, Miss Hopley endeavours to find a use for everything; to seek out the purposes which the creatures themselves serve in creation, as well as to discover the utility of the various component items in the economy of each individual. Thus we find the tongue, the

rattle, the hood, and even the horns and prolonged snouts of some species, not merely accepted as curious facts, but discussed intelligently from a physiological point of view. Concerning the first we are told:—

"For the most part nocturnal, winding their way under tangled masses of vegetation, often in dark caves, holes, crevices and obscure retreats, with their eyes so placed that they can see neither before nor under them, and with other senses only feebly developed; the tongue, with its sensitive papillæ, feels its way and conveys impressions to its owner. Cats have their whiskers to help them in the dark; moles and mice have their quick sense of smell to guide them; all nocturnal animals are gifted in some manner or another, but snakes have only their tongue. . . . . .

"Much as an insect uses its exquisitely-constructed antennæ, so does a snake its long, slender, pliant, bifurcate, and highly-sensitive tongue. Ever busy, ever vigilant, exploring while barely touching each surface within reach, yet by night and by day conveying with that slight contact all necessary information to its owner. Sent out with the speed of a flash, it telegraphs back with like quickness the result of its discoveries."

The writer betrays an obvious partiality for the *Crotalidæ*, some of the best chapters being devoted to that family, while the illustrations of the different rarities are noteworthy for their fidelity to Nature. An amusing account of a rattlesnake battue is quoted from Catlin. The sections devoted to the sea-snakes and serpent-worship are especially interesting, and under the heading "The Great Serpent" a vast amount of testimony and learned opinion in favour of, and adverse to, the existence of such a monster is adduced. Many little points, too, well worthy of attention, are noted. The possibility that rare and singular snakes, which have been classified in museums as the sole representatives of new varieties, species, or even genera, may be nothing more than hybrids, is inferred from a case of hybridisation which actually occurred in the reptilium at the Zoological Gardens, and is a consideration which may be extended far beyond the domain of ophiology. As practical, also, is the solution of the mystery which has puzzled many observers, who have found vegetable substances in the intestinal canal, *viz.*, that they were simply the contents of the stomach of some animal which has been swallowed by the snake, and dissolved away from them. We have seen grain from a pigeon's crop rejected by a boa, and still retaining sufficient germinal vitality to grow when

planted. In all probability, the *Scolopendræ* found in the stomach of *Echis carinata* can be accounted for in a similar manner; and in any case a decided negative may be given to the hypothesis of Aristotle, mentioned in conjunction therewith (p. 579).

The illustrations, by Mr. A. T. Elwes, add much to the value of this work, and are original, both in conception and design. Especially to be commended are those which represent various anatomical details, either of the natural size or indefinitely-stated relative dimensions, and aid greatly in the study of the physiology of the different organs.

Since without a grumble or two criticism would be uncritical, one may take exception to certain curious plural forms of generic titles, as used to denote individuals,—*Bungari*, *Tropidonoti*, *Trigonocephali*, *Bucephali*, &c. The name of the genus is the standard of a regiment: there is but one, and it cannot be multiplied as a designation for Privates Brown, Jones, and Robinson. Again, it is somewhat surprising to find in a book on "Snakes" two whole chapters (by no means uninteresting in their way) devoted to slow-worms. True, they are brought in as a sort of theatrical contrast to the Anaconda, by virtue of their diminutive size; but seeing that *Anguis fragilis* sometimes attains a length of twenty-two inches, and is really a rather thick and bulky little reptile in proportion, it may be doubted whether some of the excessively lithe and slender whip- or tree-snakes would not have served the purpose better, preserving the ophiological unities at the same time. Some kinds of *Oxyrhopus* and *Liophis* are very small also, not to mention the rare *Stenorhina freminvillei* (*Microphis quinquelineatus* of Hallowell).

Lastly, in her desire to be strictly impartial and unbiassed, Miss Hopley occasionally admits evidence which appears to be insufficiently supported:—"A farmer," "a clergyman," and sundry anonymous "gentlemen" are quoted; and one "Charles Smith, who was ploughing near Chicago," also contributes his testimony. The species *Smith* is familiar to most of us, but the soul athirst after knowledge yearns for some further identification of the particular specimen. And the name of the gentleman, clergyman, ploughman, or whoever he was that furnished the tale of a tame boa-constrictor dying of grief because its master was unwell, ought surely to be handed down to posterity!